

Quarterly Report – Public Page

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Contract Number: DTPH56-15-T-00019

Prepared for: DOT/PHMSA

Project Title: Intrinsically Locatable Technology for Plastic Piping Systems

Prepared by: Operations Technology Development

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For quarterly period ending: March 31, 2016

Project Scope

The scope of the project will be to develop an electronic marking system that will provide locatability to the target depths on various diameter high density polyethylene (HDPE) and medium density polyethylene (MDPE) for gas applications. The project will also assess the technology capabilities versus pipe diameter, burial depth, and pipe burial methods (horizontal directional drilling, open trench, etc.). Included in the marker development will be the development of a flexible housing to allow the solution to be adaptable to a wide range of pipe diameter sizes. The attachment method will be integrated into the plastic pipe manufacturer process and workflow. Laboratory and field evaluations will be performed to validate the system to be commercially viable as an intrinsically locatable PE piping system.

Technical Status

During the second quarter, the project team assessed the developed concepts of the markers and initiated the development of flexible housings for the markers.

The marker assessments were conducted to determine location accuracy, detection gap, and depth accuracy. The technical team also developed concepts for flexible housing to meet the pipes bend radius, type, size, and installation methods.

All the following activities were completed during the 2nd quarter:

- Marker/pipe location accuracy,
- Detection gap between markers along the pipe, and
- Locator's depth estimate accuracy.
- Conceptualized carrier designs

- Carrier analysis
- Conceptualized housing designs
- Housing analysis

All the requirements of deliverable #3 (Task #2) and deliverable #4 (Task #3) were completed during the second quarter.

Target system specifications, design specifications, concepts, breadboards and assessments are complete and show design capability.

Results and Conclusions:

The project is progressing well with good assessment results for the markers developed. In addition, various concepts for the flexible housing to meet the pipe's bend radius, type, size and installation methods were developed. The anticipated stresses from handling and installing plastic pipes have been simulated on two basic configurations and housing designs without revealing any issues of concern. The designs show promise and are ready to be taken to the next step of prototyping for physical testing.

All the requirements of deliverable #3 (Task #2) and deliverable #4 (Task #3) were completed during the second quarter.

Plans for Future Activity:

During the next quarter, the following activities will be conducted:

- Finalize Task 2 and assess the stability of the markers resonant frequency and gain shift over temp., time, and environmental conditions.
- Continue work on the Marker Housing Development efforts in Task 3, including aging effects in buried conditions.